REMARKS

Reconsideration of the application in light of the amendments and the following remarks is respectfully requested.

Status of the Claims

Claims 1-12 are pending. Claims 2 and 10 have been amended. Claim 12 has been added. No new matter has been added.

New claim 12 recites most of the features of dependent claim 11, along with its base and any intervening claims. Applicant submits that claim 12 is in condition for allowance.

Allowable Subject Matter

Applicant appreciatively acknowledges the Examiner's indication of allowable subject matter in claims 10, and 11. As discussed below, Applicant submits that claims 10 and 11 are in condition for allowance.

Objection to the Claims

The Examiner has objected to claims 2 and 10 for containing informalities of a typographical nature. Claim 11 has been objected to for depending from an objected base claim. Specifically, the Examiner has objected to the strikeout/underlining used in the previous amendment to remove a semicolon and add a period. Applicant submits that the amendments to claims 2 and 10 conform with U.S. patent practice, and do not narrow the

scope of the subject matter contained therein. Applicant requests reconsideration of the objection.

Rejection Under 35 U.S.C. § 103

Claims 1, 2 and 4-8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Admitted Prior Art ("AAPA") in view of U.S. Patent No. 5,117,418 to Chaffee, et al. ("Chaffee"), U.S. Patent No. 6,252,902 to Simeon, et al. ("Simeon"), and either of U.S. Patent No. 4,074,086 to Falconer et al. ("Falconer") or U.S. Patent No. 5,136,576 to Brownlie. Applicants respectfully traverse the rejection.

The Examiner contends that the AAPA discloses most of the features of claim 1. However, the Examiner acknowledges that the AAPA does not disclose (1) calculating the EC coefficients based on a transformed echo-cancelled signal; (2) that a first signal is a wide-band cyclic sequence; and (3) the use of a control signal to control timing of signal transmissions. The Examiner contends that Chaffee discloses calculating EC coefficients based on a signal transformed by an FFT, and that Simeon discloses cyclic sequences for training a modem. The Examiner cites either Falconer or Brownlie as disclosing the use of a control signal to control timing of signal transmissions. The Examiner contends that it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the AAPA, Chaffee and Simeon with either Falconer or Brownlie to achieve the invention of claim 1.

Applicant respectfully disagrees. The present claims are directed to methods and devices for calculating echo-canceling (EC) coefficients. The EC coefficients are calculated directly from correlation sequences of the transmitted and echo signals. The present application discloses that a coefficient estimator 100 provides a control signal 104 to a constellation encoder 16:

> The control signal controls the timing of the transmitted signals, i.e., which signal would be transmitted at which time. . . . The control signal assists in the calculation of the EC coefficients by ensuring that channel response measurements are performed on designated transmitted signals. [B]ased on this synchronization, the coefficient calculator may determine the times at which the constellation encoder transmits appropriate reverb signals.

(Specification, page 8, lines 2-11.) Claim 1 recites "providing at least one control signal to control the timing of said transmitting step so that said calculating step is performed for predesignated signals." Based on the control signal, the coefficient estimator determines the EC coefficients only during the transmission of selected signals, i.e., predesignated signals.

Falconer discloses an echo canceller 34 that is connected to a data source 31 and a timing source 45 that controls the data source 31 and the input to the echo canceller 34. (Falconer, column 5, lines 35-39, and Fig. 2.) Falconer discloses that "for optimum echo cancellation it is apparent that cancellation sequence f_k should have substantially the same timing rate as equalized sequence s_k. This is accomplished when transmitted symbol interval T_W equals receiver symbol interval T_E." (Falconer, column 6, lines 60-65.) When T_W is not equal to T_E, "the situation is remedied by skipping the next readout." (Falconer, column 7,

lines 1-7.) Applicant submits that Falconer merely discloses dropping data to maintain signal timing. Falconer does not disclose calculating EC coefficients for predesignated signals, as determined by a control signal as recited in claim 1.

Brownlie discloses "a digital transmission system (e.g., for facsimile transmission) in which first and second stations 1, 2 are connected via a 2-wire telephone circuit 3. Station 1 has a transmitter 11, receiver 12, hybrid circuit 13, adaptive echo canceller 14 adaptive equaliser 15, and control means 16." (Brownlie, column 3, lines 2-7.) Brownlie discloses that "[i]f the control means at station 2 recognises a transmission error, it signals this fact rapidly to station 1 by means of a burst of transmission during period TR so as to call for the re-transmission from station 1 of digital data previously received at station 2 with errors in transmission (or of analogue data received by station 2 in some unacceptably corrupted form)." Applicant submits that Brownlie discloses a control means that signals for re-transmission of a previously transmitted signal, which was recognized to either contain transmission errors or be in an unacceptably corrupted form. Brownlie does not disclose or suggest "providing at least one control signal to control the timing of said transmitting step so that said calculating step is performed for predesignated first signals" as recited in claim 1.

For the reasons discussed above, the combination of the AAPA, Chaffee, Simeon, and either Falconer or Brownlie neither discloses nor suggests, singly or in combination, the invention of claim 1. Claims 2 and 4-8 depend from claim 1, and recite limitations in addition to those set forth in claim 1. Therefore, Applicant submits that claims 2 and 4-8 are patentable over the combination cited by the Examiner for at least the same reasons

as claim 1. Thus, the Examiner has not established a *prima facie* case of obviousness over claims 1, 2 and 4-8. Reconsideration and withdrawal of the rejection is requested.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of Chaffee, Simeon, either Falconer or Brownlie, and U.S. Patent No. 6,101,864 to Abrams et al. ("Abrams"). Applicant respectfully traverses the rejection.

The Examiner cites Abrams as disclosing generating a signal through the use of a lookup table. The Examiner contends that it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the AAPA, Chaffee, Simeon, either Falconer or Brownlie, and Abrams to achieve the invention of claim 3. Claim 3 depends from claim 1, and recites limitations in addition to those set forth in claim 1. Applicant submits that Abrams neither discloses nor suggests the features of claim 3 missing from the combination of the AAPA, Chaffee, Simeon, and either Falconer or Brownlie as discussed above with respect to claim 1. Therefore, Applicant submits that the combination of the AAPA, Chaffee, Simeon, either Falconer or Brownlie, and Abrams does not disclose or suggest the invention of claim 3.

Additionally, in response to Applicant's argument that Abrams is non-analogous art, the Examiner states that "Abrams deals with digital circuitry used in signal processing, as do the other references." (Detailed Action, page 6, item 7.) However, Abrams is in the field of testing closed loop transducers, such as accelerometers for seismic data acquisition systems. (Abrams, column 1, lines 8-12.) Accordingly, Applicant submits that Abrams is non-analogous art, and at the time of the invention a person of ordinary skill in the art of echo

cancellation filters for communication modems would not look to Abrams to achieve the invention of claim 3.

Reconsideration and withdrawal of the rejection is requested.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the AAPA in view of Chaffee, Simeon, either Falconer or Brownlie, and U.S. Patent No. 6,535,552 to Pessoa. Applicant respectfully traverses the rejection.

The Examiner cites Pessoa as disclosing multiplying filter coefficients by a window coefficient. The Examiner contends that it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the AAPA, Chaffee, Simeon, either Falconer or Brownlie, and Pessoa to achieve the invention of claim 9. Claim 9 depends from claim 1, and recites limitations in addition to those set forth in claim 1. Applicant submits that Pessoa neither discloses nor suggests the features of claim 9 missing from the combination of the AAPA, Chaffee, Simeon, and either Falconer or Brownlie as discussed above with respect to claim 1. Therefore, Applicant submits that the combination of the AAPA, Chaffee, Simeon, either Falconer or Brownlie, and Pessoa does not disclose or suggest the invention of claim 9. Reconsideration and withdrawal of the rejection is requested.

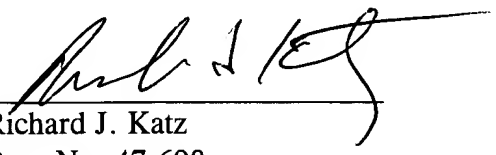
CONCLUSION

Each and every point raised in the Office Action dated December 17, 2004 has been addressed on the basis of the above amendments and remarks. In view of the foregoing it is believed that claims 1-12 are in condition for allowance. Applicant respectfully requests that

the application be reconsidered, that all pending claims be allowed and that the case be passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Respectfully submitted,



Dated: June 16, 2005

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